



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/505,387	08/20/2004	Mario Engelmann	PC10373US	7211

7590 01/16/2007  
Robert P Seitter  
RatnerPrestia  
One Westlakes, Berwyn, Suite 301  
P O Box 980  
Valley Forge, PA 19482-0980

EXAMINER
----------

MURALIDAR, RICHARD V

ART UNIT	PAPER NUMBER
----------	--------------

2838

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/505,387

Applicant(s)

ENGELMANN ET AL.

Examiner

Richard V. Muralidar

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/20/2004</u> .                                              | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Objections***

Claims 24 and 25 are objected to because they are device claims (as evidenced by "circuit arrangement" in the preamble) that depends from method claims (13 and 24 respectively). Claims 24 and 25 are also objected to because they are device claims that contain method steps ("the method as claimed in claim 13"). Claim 25 is further objected to because it is a device claim that appears to depend upon two separate claims- claim 24, a method claim, and claim 13, another method claim. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites an "effective current" and a "measured current" in line 1. In Lines 4-7, applicant satisfactorily defines "measured current" as a current measured during an actuation period, which is then compensated for with temperature and voltage variables, to produce a nominal current. However, applicant fails to define what "effective current" is. Applicant should define "effective current" in the claim language so that it is clear what "effective current" is referring to, as well as to clarify exactly how "effective current" is different from "measured current." Applicant's specification [see page 4] is also vague

concerning what "effective current" is. It appears that the deviation between effective current and measured current may be the result of saturation and hysteretic effects due to the solenoid valve's iron core. It is unclear whether this is implying that effective current itself is a result of saturation and hysteresis, or that only the deviation between effective current and measured current is. Appropriate correction is required.

Claim 21 recites the limitation " the connected semiconductor " in line 2. There is insufficient antecedent basis for this limitation in the claim, since there is no previous mention of a connected semiconductor in any of the prior claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Furuya et al. [U.S. 6322166].

Claims 1-12 [Canceled by applicant].

With respect to claim 13, Furuya discloses a method for reducing deviations [col. 7 lines 43-50; col. 13 lines 9-29; col. 14 lines 50-55; col. 18 lines 59-67; col. 19 lines 51-64] between the effective current and the measured current [estimated regenerative current and detected regenerated current- col. 3 lines 65-67 and col. 4 lines 1-20;

Art Unit: 2838

gradient  $z$  and regenerative current- col. 13 lines 9-29; col. 14 lines 1-28; col. 15 lines 6-24] in a pulse-width-modulated current control [col. 2 lines 38-53, lines 60-65; col. 11 lines 33-37], in particular for electronic brake control units of motor vehicles [Fig. 3, col. 1 lines 5-19], wherein the measured current is determined at a certain predetermined time during an actuation period and a compensation is executed by way of compensation variables in response to temperature and supply voltage [col. 17 lines 60-67 and col. 18 lines 1-5], which are added to the measured current [col. 18 lines 43-48] so that a corrected nominal current is available for current control [col. 18 lines 15-67].

With respect to claim 14, Furuya discloses a method wherein the supply voltage dependency is compensated col. 17 lines 60-67 and col. 18 lines 1-5].

With respect to claim 15, Furuya discloses a method wherein the compensation variables are stored in a table, in particular in a data memory [col. 3 lines 59-64; col. 4 lines 1-20].

With respect to claim 16, Furuya discloses a method wherein several loads are driven, and the compensation variables are fixed individually for each load, in particular for each valve coil [col. 8 lines 37-49; col. 11 lines 5-15; col. 15 lines 42-52].

With respect to claim 17, Furuya discloses a method wherein an interpolation is carried out for temperatures lying between two table values in order to determine the optimal compensation variable [Fig. 17, col. 18 lines 21-28].

With respect to claim 18, Furuya discloses a method wherein an interpolation is carried out for supply voltages lying between two table values in order to determine the optimal compensation variable [col. 17 lines 3-6].

With respect to claim 19, Furuya discloses a method wherein an averaging operation is executed by way of the present nominal value and previous nominal values to compensate abrupt changes in nominal values [col. 15 lines 60-67 and col. 16 lines 1-35].

With respect to claim 20, Furuya discloses a method wherein the temperature is determined indirectly by way of the Duty Cycle adjusted by current control [col. 18 lines 6-15].

With respect to claim 21, Furuya discloses a method wherein the sum of the coil resistor and the resistor of the connected semiconductor component for driving the load is taken into consideration for the determination of temperature [col. 18 lines 6-15, the duty ratio from which temperature is determined is affected by both all resistances in the circuit, including the coil and the switch].

With respect to claim 22, Furuya discloses a method wherein the Duty Cycles of several PWM periods are averaged for temperature measurement or the determination of the indirect temperature value [the duty cycle of gradient  $z$  encodes the temperature information within in, col. 15 lines 60-67 and col. 16 lines 1-35].

With respect to claim 23, Furuya discloses a method wherein the nominal resistance value of the coil is used at the presently measured or estimated temperature of the control unit for the average value of the indirectly determined temperature

quantity directly after the switching on of the ignition, in particular after the ignition's re-start [col. 14 lines 56-60; col. 19 lines 6-20].

With respect to claim 24, Furuya discloses a circuit arrangement for driving several inductive loads comprising a circuit for the PWM control of the load current, wherein the method as claimed in claim 13 is implemented as a program [Fig. 7, Fig. 9, Fig. 11, Fig. 16, Fig. 22, Fig. 25] in a microcomputer or microcomputer system [Fig. 1, control means] which is electrically connected to the PWM circuit.

With respect to claim 25, Furuya discloses a circuit arrangement for driving several inductive loads comprising a circuit for the PWM control of the load current, in particular according to claim 24, wherein the method as claimed in claim 13 is realized at least in part by digital logic [Fig. 1, the control means is a digital logic controller].

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

  
KARL EASTHOM  
SUPERVISORY PATENT EXAMINER

Art Unit: 2838

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RVM

1/06/2007